



Supplement of

TROPOMI tropospheric ozone column data: geophysical assessment and comparison to ozonesondes, GOME-2B and OMI

Daan Hubert et al.

Correspondence to: Daan Hubert (daan.hubert@aeronomie.be)

The copyright of individual parts of the supplement might differ from the article licence.

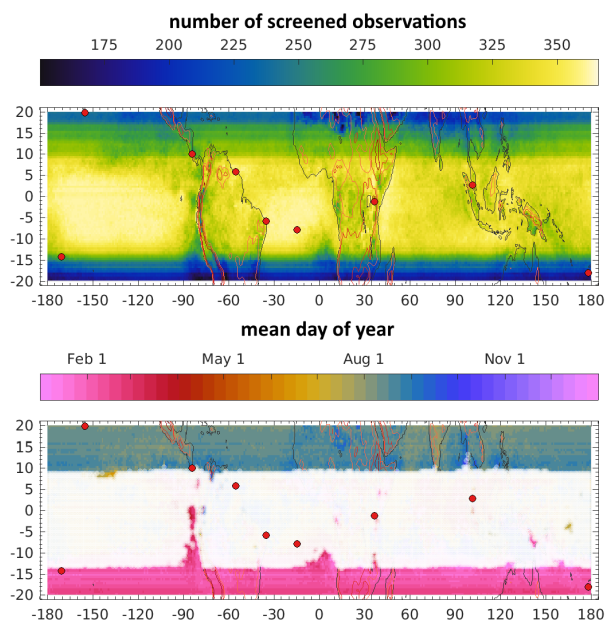


Figure S1. Sampling statistics of two years of screened TROPOMI tropospheric O₃ column data (1 May 2018 – 30 Apr 2020): (top) number of TrOC values per year, (bottom) mean day of year. In the outer tropics, winter / early spring data are often screened due to the absence of thick convective clouds in the stratospheric reference region. Grid cells with a uniform sampling time distribution are whitened out. Red markers show the location of the SHADOZ sites considered in this study. Red isolines trace the 500, 1000 and 2000 m surface elevation levels. This figure supplements the annual statistics of TrOC in Fig. 1 in manuscript.

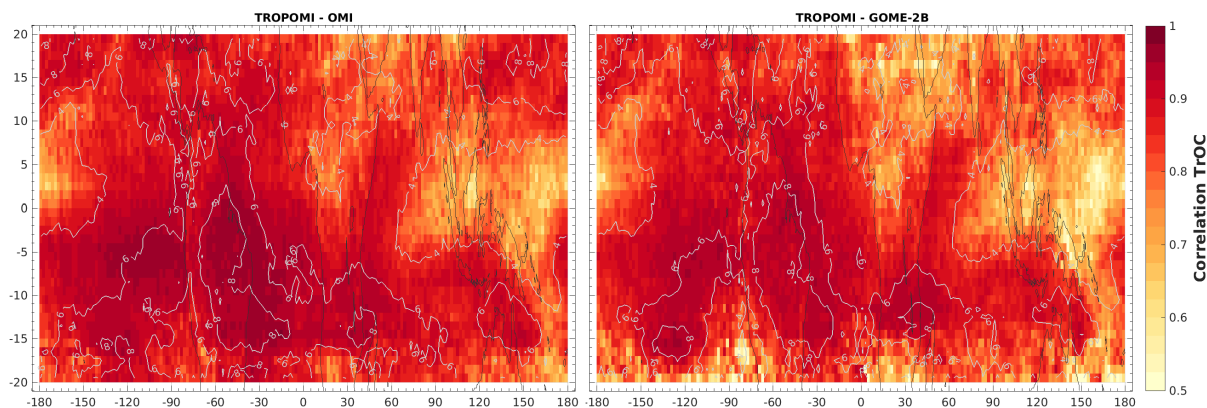


Figure S2. Skipped Pearson correlation coefficients for TROPOMI versus OMI (left) or GOME-2B (right) TrOC time series; white contours trace isolines of spread in TROPOMI TrOC (Fig. 1 centre in manuscript).

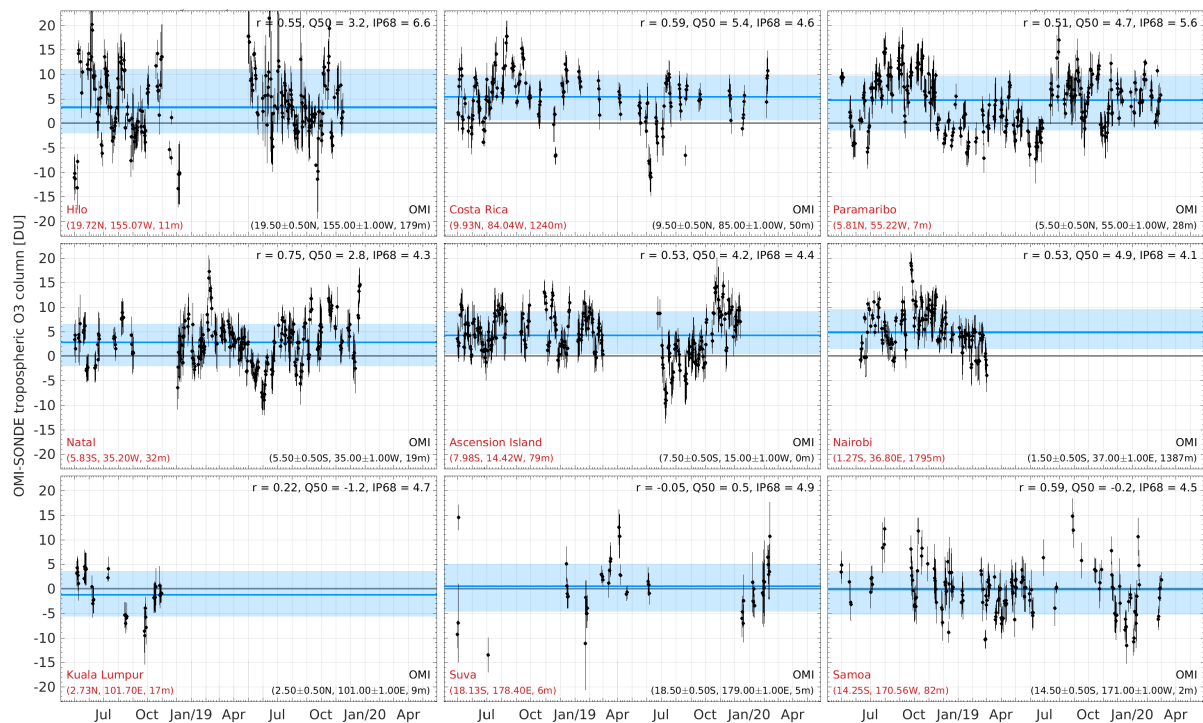


Figure S3. Like Fig. 4 in manuscript. Time series of the difference between spatially and temporally co-located OMI and ozonesonde tropospheric ozone column data over nine SHADOZ sites. Positive values indicate that OMI overestimates the ozonesonde value. Blue line and area show median (Q50) and 68% interpercentile (IP68) over the entire period.

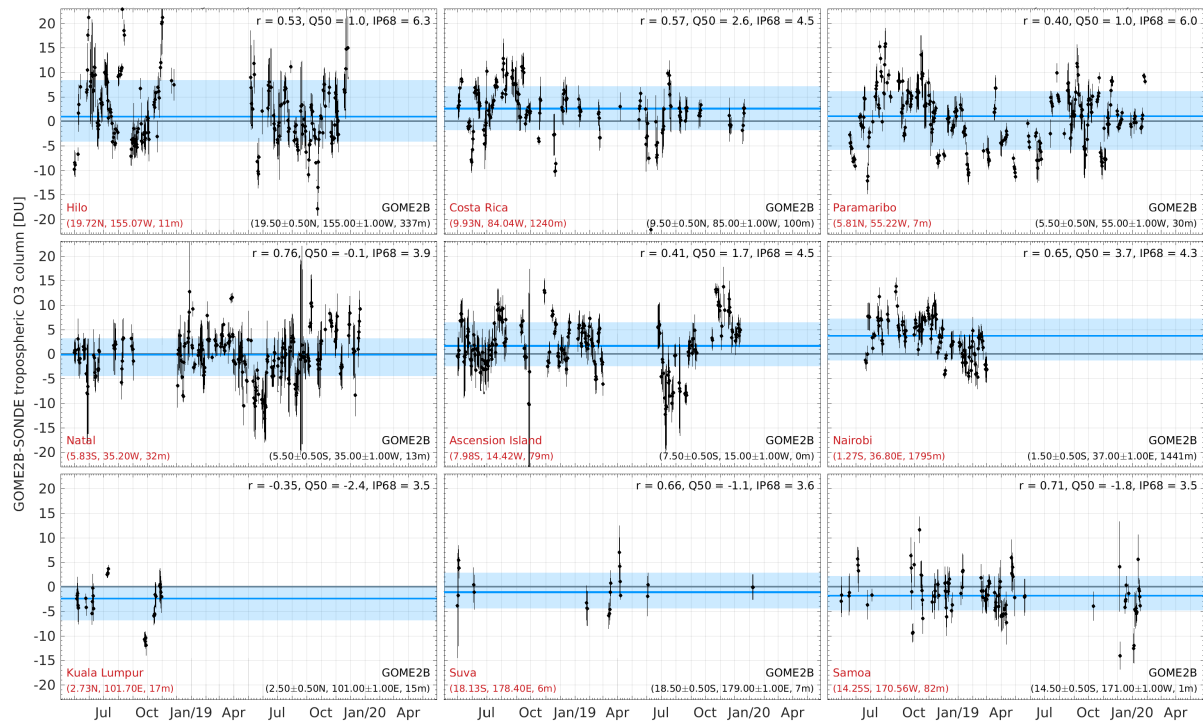


Figure S4. Like Fig. 4 in manuscript. Time series of the difference between spatially and temporally co-located GOME-2B and ozonesonde tropospheric ozone column data over nine SHADOZ sites. Positive values indicate that GOME-2B overestimates the ozonesonde value. Blue line and area show median (Q50) and 68% interpercentile (IP68) over the entire period.

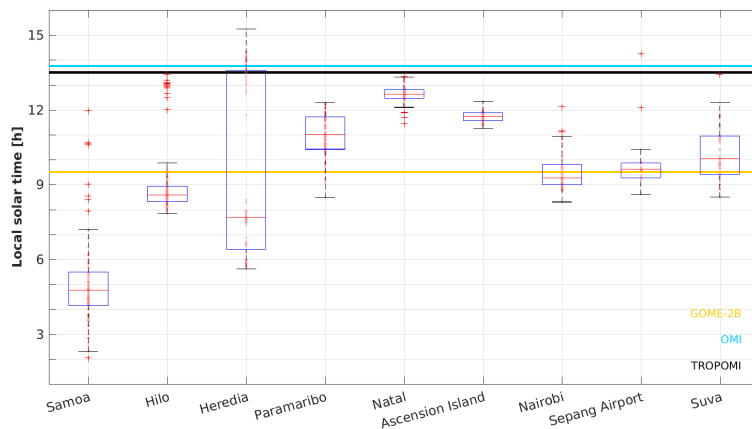


Figure S5. Statistics of local solar time of ozonesonde launches at each SHADOZ station in comparison to the fixed overpass time by the three satellite sensors (horizontal lines). The box shows the 25%, 50% and 75% quantiles, whiskers cover the 99.3% interpercentile, red markers represent individual flights. Stations are ordered West to East.

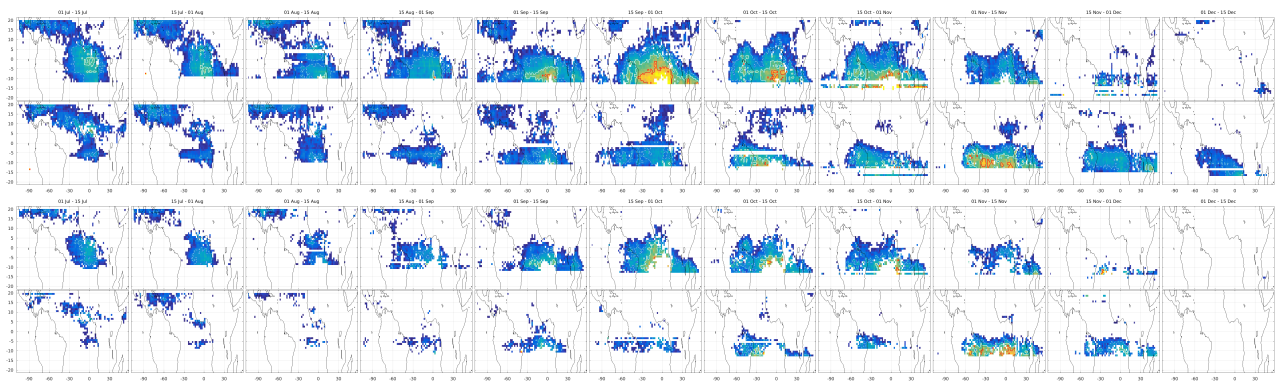


Figure S6. Like Fig. 12 in manuscript. Median biweekly OMI (top) and GOME-2B (bottom) TrOC over Atlantic basin between early July and mid December in 2018 (left) and 2019 (right). Grid cells with sparse or inhomogeneous temporal sampling or a value below 30 DU are blanked. Contours indicate the 35 DU (dashed), 40 DU (solid) and 45 DU (red) isolines. As a result of a ~ 2 DU low bias of GOME-2B with respect to OMI and TROPOMI the area above 30 DU is considerably smaller.